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Laryngitis
Croup
Cynanche Trachealis

An Essay
On
Cynanche Trachealis
Or
Croup.

Withdrawn at the end of his examination March 18th 1824
W. R. H.
Dean.

By
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of
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Introduction.

In conformity with the rules and regulations of The Medical College of Philadelphia, requiring a dissertation from each Student, looking foward to Medical Notice, I have attempted to produce such a one as will meet the approbation of the Trustees and Professors of the said Institution.— It might be considered presumptuous in me, a mere novist in the Profession, to strike at originality, but more so in a disease, which appears to be so well understood, by the different Professors of the healing art, & at the same time so elaborately discussed by the various Authors, who who have written on it:- I therefore have contented myself, by giving as precise & as fair a statement of the History, Causes, Symptoms, Diagnosis & Treatment of the disease, as I could collect from such authors to which I had access.— I have divided the disease into Idiopathic & Symptomatic, but of the latter I have said nothing, its treatment appearing more properly to come under the head of the disease, which it may supervene.

Cynanche Trachealis or Croup.

Trachitis according to the most approved nosological diffinition, is an inflammatory affection of the mucous membrane of the Trachea & Larynx, frequently embracing the Bronchiæ and Lungs, accompanied with a difficult & laborious breathing, inspiration attended with a loud peculiar noise, voice hoarse, cough hollow & sonorous, no tumour of the fauces, nor difficulty of deglutition.— Croup is more commonly met with in temperate, than in colder climates, & is more prevalent in winter than in spring, though peculiar to no season, as it appears chiefly to depend upon the state of the Atmosphere.— It has been asserted by some Authors, that Croup occurs more frequently on the sea board & in low marshy situations, (though not confined to them) than at a distance from the ocean.— It does appear that the vicissitudes of the ~~atmosphere~~ temperature of the atmosphere are greater in proportion to the vicinity of the

sea, & as changes of weather induce the disease may not the position be established in this way:—
The usual way in which this disease comes on, is with a small degree of dyspnœa, & that very suddenly; as it progresses the difficulty of breathing is increased, appearantly of a wheezing nature, in consequence of the passage for the air, being obstructed.— Should the patient be old enough, he complains of a pain and tightness about the Larynx accompanied with a degree of tenderness on being felt, & frequently by moving his head either on one side or the other, an acute pain will seize him instantly but not of long duration, for as soon as the head is again restored to its former position the patient becomes comparitively easy.—
The dyspnœa sometimes increases rapidly, in other cases slowly, so that frequently the difficulty of breathing for some days, may last, before the little sufferer is pronounced

seriously ill.— Another diagnostic of this disease is, that there is great degree of rattling attendant on the wheezing, though it does not follow that this is a natural consequence.— The voice, on account of its shrillness, has been generally compared to the peculiar noise occasioned by the cock, when labouring under that disease, which to many, is known by the title of Pip; or to that unpleasant & jarring noise issueing from a brazen tube.— Authors have asserted, that in no one instance has it been met with in Adults, but that opinion is erroneous, for we have on record, the instance of the Memmorable & ever Lamented General Washington, & Professor Hosack in one of his papers mentions a similar case.— Dr Rush also treated a case of this kind in a man by the name of Bampfield from Virginia.— Croup is not so frequently

met with in Children previous to their being weaned, as it is, after the period of lactation has passed by; for the liability to the disease appears to decrease, as they advance in age, in as much that it is of rare occurrance after we have arrived at the age of twelve or thirteen years.— The great peculiarity of this disease, is the formation of a membranous coating within the Trachea, an exudation of coagulable lymph thrown out by the exhalent arteries, the more fluid or watery parts being either evaporated or absorbed.— As soon as the difficulty of breathing becomes considerable, the pulse is full & hard; at the same time head ache & restlessness supervene & the little patient complains of great thirst. his skin being hot & parched & his tongue white & very foul.— The urine discharged is small in quantity & with much difficulty, & as the disease advances it becomes turbid.

& more in quantity, & towards the favourable termination it deposits a copious sediment.— Generally speaking, during the whole course of this disease, the bowels are for the most part greatly inflated.— In Cynanche Trachealis, as well as most of the Phlegmasiæ, however alarming the other symtoms may be, there is never any delirium present, though the fever may be high; however a small degree of coma may frequently attend.— Upon examination "Post Mortem" almost universally this preternaturally formed Membrane has been found lining the internal surface of the Trachea, extending down into the different ramifications of the Bronchiæ, & Dr. Bard has observed, & (very justly) that the disease is not confined to the Trachea & Bronchiæ alone, but that the Lungs are also affected by it, for by cutting into them, they have been found hard & dense, resembling the firm

texture of the liver, instead of the spongy appearance which they naturally exhibit. — In different cases of this disease, the lungs assume, (according to authors who have written on the dissections of this part of the body with minuteness) all the various appearances of Pneumonia. — (Says Michaelis) the appearances of those children who have died from croup, are various, for sometimes there is a sanious matter extravasated in different parts of them, sometimes the matter found, is purulent, & at other times merely a watery fluid the quantity of which is often considerable. — Similar remarks are made by Dr Cheyne on the appearances exhibited after dissection. — These appearances seem evidently the result of increased action in the arterial system. — The diameter of the tube, through which the air passes to the lungs, being lessened by this membrane & the lungs

themselves being obstructed, accounts for the extreme difficulty of respiration in the advanced of the disease.— Croup, has been said by some writers to be of two distinct species, namely, Spasmodic & Inflammatory, but this division seems to be ill grounded, the spasmodic contraction being a consequent of the existing inflammation, producing a morbid sensibility of the affected part.— The late Dr. Rush, was of the opinion, that there was a spasmodic species, but he relinquished it, after seeing a paper written by Dr. Hosack of New York.— As various are the opinions concerning the nature of the disease in question, so are they generally adopted by the different schools.— And as it is customary, we will draw a few inferences, from some of the most able & experienced Authors.— It was the opinion of Dr. Home, that whenever there happens

to be a very great secretion of coagulable ~~lymph~~ fluid from the glands of the Trachea in Children, it is owing to their nurses not being attentive enough, or they being too young to expectorate. — The thinner parts are carried off during expectoration, & the thicker being left behind, it is consequently compressed by the obstruction which it meets with, owing to the passage of the glottis, being to narrow to give vent sufficiently to the air that passes through it ~~to~~ from a larger canal. — In this case every circumstance encourages its concretion into a solid firm membrane; while the more internal parts of the mucus continues fluid, & the continual secretion of more keeps it seperated from the parts below. — Now Dr Rush takes another view of the subject, by saying, that the preternatural membrane lining the Trachea, is not the origin of the

disease, on the contrary he thinks it highly adventitious, for this membrane supervenes after the disease has been existing for a length of time, now the conclusion, appears to be this, that the cause of any disease ~~must~~ must be prior to the disease itself, for without that was really the case, there would be no cause, & as Dr Rush's opinion, seems to be the most correct, & at the same time the most powerfull, we cannot do otherwise than adopt it, at any rate in this particular instance. — With regard to the infectious nature of the disease, it is needless to say much, for there are proofs enough on record, to establish this position therefore this one instance would be sufficient, were they not many more, which is, in Dysentery, where there is much inflammation in the Intestines, & when there is much lymph thrown out, & not unfrequently

forms adhesions, which I think would be the case in inflammation of the Trachea were it possible for the Lungs to continue uninterrupted, & the sides of the Trachea to be brought into coaptation. — But other circumstances favour the idea of its infectious nature, for it frequently attacks more than one in the same family, & it occasionally has prevailed epidemically. — In such instances it would appear that they were all under the influence of the same atmosphere, & when it occurs in particular families more frequently than in others, it must arise from a particular temperament predisposing to the disease. — Dr. Rush in his Medical Enquiries, volume the first, observes, that he has known Croup to accompany, & also to succede small pox, measels, sore throat & scarlet fever &

that he was informed by one of his medical friends, of its occurrance in Yellow Fever in the year 1798.— Dr. Ferrian remarks that, in two cases he has seen it supervene as an accessory disease upon Cynanche Maligna, & in one instance in a boy about seven years old he has seen pneumonic inflammation converted into croup on the tenth day after the disease which destroyed on the day following.—

Predisposing Causes.— The predisposing causes are a plethoric state of the constitution, early ages & previous attacks.— This predisposition exists in the constitution for some time, but it gradually wears away as we advance in years, & where a predisposition exists from a former attack of the disease, slighter causes are required to excite inflammation, than would be necess=

-ary under other circumstances.— This predisposition is not only common to Trachitis, but also to Tonsilitis & Pneumonia.
— Exciting Causes.— The exciting causes are a sudden transition from cold to heat, more particularly during the prevalence of easterly winds, & exposure to a current of air, damp, moist weather, wetting the feet & neck & exposure to the night air after a hot day.— Dr. Cheyne remarks, that in cold changable weather this disease is very prevalent, frequently appearing after a cloudy & hazy day, & he observes, that he has known a Mother in whose family the disease had often made its appearance, kept in continual anxiety by this state of the atmosphere.— It is not improbable that certain states of the alimentary canal may assist in producing this disease.— Underwood

in his treatise on the diseases of children observes, that the change from milk, to food of a harder digestion, is probably sometimes the cause of Croup, & he goes on to say, that it is occasioned by fevers or chronic diseases, that tend to diminish the strength of the patient.— Proximate Cause.— The proximate cause, is an inflammation of the mucous membrane lining the Trachea & extending to the Bronchiæ & its ramifications.— From a knowledge of this cause, we are enabled to form a correct idea of the treatment to be pursued, & to institute such a plan of practice as will be most suitable to the removal of the disease.— Trachitis has been divided into three distinct stages.— First the forming, second, the febrile, & third the membranous or purulent.— This division I think proper to

adopt.— In the first or forming stage the disease consists merely in a local affection, the system not yet being involved in the general irritation, which will follow if the local disease is not timely removed.— Symptoms.— In the first stage, the child is in a state of morbid excitement, rather pleasurable than otherwise, he will be laughing, playing & manifesting a degree of sprightliness, no acceleration of pulse discoverable, skin cool & moist, but its hoarse hollow sounding & frequently returning coughs, its hissing inspiration & restlessness & especially its
es after a paroxysm of coughing, though occasional easy breathing, all point out to those conversant with the disease, the dangerous consequences that will follow if prompt & efficient measures are not adopted to ward off the accession of the second or succeeding stage of the disease.—

The second or Febrile stage is characterized by active inflammation & general irritation of the system, frequency of the pulse, a hot & dry surface, white furred tongue thirst, hurried respiration, lips & cheeks preter=-naturally rosy, frequent coughing, creating a more acute sound than is observed in the first stage & more regular in the hissing noise. — Now the vessels of the Trachea, Bronchiæ & Lungs become distended & filled with blood, from the determination to those parts, producing great oppression. — The child experiances not a moments alleviation of its sufferings & if no means are resorted to in order to procure relief, in a little time, particularly in plethoric habits, the face becomes of a purple or livid hue resem=-bling apoplexy, the child manifesting an inclination to sleep, accompanied

with a degree of Stupor.— An effusion from the engorged vessels now takes place, if the treatment has been inactive or the disease neglected.— The membrane already alluded to is formed by the effused fluid, & this constitutes the third or Membranous Stage.— The thinner parts of this effusion being removed, in the Lungs it exhibits the appearance of a viscid matter, while in the Trachea the Membrane is more clearly defined.— In consequence of an insufficient quantity of air being admitted into the Lungs, from the presence of this extraneous matter & the contracted caliber of the windpipe, the decarbonization of the blood is but partially effected, & hence the livid appearance of the countenance.— When the effusion has actually taken place, a sensible decrease of the febrile irritation, succeeds. The child becoming more cool & composed, though the spasmodic paroxysms frequently recur with

violent coughing & difficult respiration.— Sometimes so difficult is respiration, that immediate suffocation is threatened, & the child is induced to throw its head back to avoid the danger, & as by this means the Trachea is extended & rendered pervious to the air.— Life is now frequently terminated by the superventeon of convulsions.— Diagnosis.— Trachitis differs from Laryngitis in this way, there being no external swelling in the former.— In the latter some degree of tumefaction is likewise to be discovered in the Tonsils, which is not present in the former.— It is distinguished from Pharyngitis, by the painfull & difficult deglutition being absent in Croup, & from oesophagitis in the same manner.— Treatment.— The remedies usually employed in this disease, are so various, that at times we feel ourselves at a loss which plan to adopt, but I shall attempt to lay down that course which is generally estimated by Authors to be the best & most approved.—

The Professor of the practice of Physick, in this University, recommends in the highest & most flattering manner, the use of Emetics in the first stages of the disease, & he prefers the Antim: Tartarizd: in large & repeated doses, bearing in mind this precaution, that the child should be put into the warm bath & there suffered to remain ten or fifteen minutes.— By this single operation, a cure has been often effected, & this is not the only reason for using it, for it is the received opinion that the warm bath facilitates the operation of the emetic.— Should this trial fail in the attempt, we must again have recourse to the emetic & at the same time use the Lancet in a very free and copious manner, together with the warm bath.— He goes on to say, that it must be a very obstinate case, that does not yield to these powerfull remedies.— The next step to be done, in case of no relief, is the application

of Topical bleeding, which is performed by cups applied to the throat, reaching from one ear to the other, & should this fail we should employ Venæ. Sectio: ad Deliquium Animi, for when carried to this extent it seldom, if ever, fails of giving immediate relief. — After all the symptoms, such as the cough & fever, have subsided, the next thing to be done, is to employ Calomel, not in small & frequent doses, as is usual the practice, but in as large ones as possible, in order to induce the most active purging. — This mode of treating the disease, lastly by Calomel, has various inducements laid down, & among them, the leading cause is this, that it opens the alimentary canal, removes all the feculent matter lodged there during the high stage of the disease, & by this means a relapse is prevented, & recovery founded on a strong basis. — Even after all the

symptoms have abated, sometimes a little fever hoarseness & the difficulty of breathing may be still remaining, in this case the Polygala Senka, is very much recommended, as an expectorant.— Dr Chapman believes that its best powers are displayed in the remains of the disease, & I think very justly, for as an emetic, the Tart: Antimon: is far preferable.— Now Dr Cullen recommends as the first remedy to be used Bloodletting, & he observes, that so great is the confidence which he places in it, that he concludes by saying it unquestionably holds the first place among all the remedies.— Now the plainest inference that can be drawn from it, is this, that the climate in which Dr Cullen practiced, is much different from this, & that, the same mode of treatment then would not answer in this part of the globe.— Dr Hoome is

also an advocate for this manner of treating the disease.— Bloodletting, to me, is unquestionably an excellent remedy, but it must be allowed, that it requires great nicety & judgement to understand when it should, or should not be used.— Authors differ much, with regard to what vein should be opened. In some we find the external jugular, prefered to either of those in the arm, while on the other hand, we find one in particular (Dr. Hosack) as the most fit & proper, the hand to be immersed in warm water & a vein from the back part of the hand to be opened, which he asserts, can be done with great facility, owing to the vascularity of the little patients skin.— As I have already said, an emetic, should be given in the first place, & to a child under two years of age half a powder composed of grs. ij of Antimon: Tartariz: & gr. xv of Ipecac:

may be given & repeated in fifteen minutes, should the first dose not operate sufficiently, & produce a plentifull secretion from the Trachea and Lungs.— Should the bowels be constipated we would recommend the half of a common injection to be administered, & in an hour afterwards repeated, should the first not produce the desired effect.— The first six hours is the precious time for the remedies to have their effect, & at once check the progress of the disease.— But it often happens, that the Physician is called in after this, the (first stage) has passed by, & the febrile symtoms have manifested themselves, the lips and cheeks assuming a very rosy & florid hue.— Dr. Tenar remarks, that bloodletting should be continued, so as nearly to produce fainting, (for says he) there are instances on record, wherein a reaction did not take place, and the consequences were death.— Some remission

of the symtoms generally takes place after Venæ: Sectio: & now an emetic should be again given as all the symtoms may recur after a short interval.— If this mode of treatment should not prove effectual, we must again resort to the Lancet, but first, puting the patient ~~the patient~~ in the warm bath, for as long a time as has already been mentio= =ned.— Leeches may be applied to the affected part, but according to some writers they are not of any great benefit, acting only as auxiliaries.— Calomel may again be resorted to, & given in doses sufficiently large enough to produce plentifull evacuations, & repeated every two hours assisting its operation with an enema, as before mentioned.— These remedies should be put into requisition as fast as time will admit, & if they do not afford relief by diverting the irritation from the

Trachea & Lungs. & breaking the fever, the Calomel in combination with Antimony, from two to four grains each, should be administered every two hours, that is, if it necessary to keep up the evacuations; otherwise a solution of Tart: Antimon: grs ij to eight table spoonsfull of water may be made & given in doses sufficiently large enough to nauseate the stomach & produce relaxation.— The purgative plan, has been much thought of by some writers, especially Hamilton, in his treatise on purgatives as a remedy in various complaints, but at this day the other modes are prefered.— If it is necessary to check the discharge from the bowels, after the subsidence of the inflammatory action, a few drops of Tinct: Opii: may be given, or it may also be used to quiet the cough, which is sometimes very distressing & troublesome to the little sufferer: but in using this medicine remember that all inflammatory symptoms be completely allayed.— In the third

stage, when the countenance exhibits a bluish appearance & great anxiety, though occasional intervals of ease occur, but last only for a short time, when the membrane is already formed, cough without the least expectoration, returning in paroxysms, respiration performed with the greatest difficulty & the wheezing noise continuing: in this stage, which has been generally termed the fatal stage, & often proves so, the preternatural membrane has been known to be thrown off in detached pieces, by the effects of coughing and the patient recovered. — Bloodletting is not to be performed here, nor are the relaxing remedies recommended in the former stages, to be persisted in, as the debility already existing would be increased & expectoration diminished. — In this case stimulating expectorants are indicated, & none answers better than the Polygal: Senika: & according to Dr Archer of

Maryland) it not only produces copious expectoration but also perspiration, & has been found extremely beneficial, not only in his hand, but in many others who have tryed it.— Calomel in small doses, Asafoetida, syrup of onions, squills & the fumes of vinegar and water have all been tryed & found advantageous in this stage, in exciting the secretions & promoting perspiration.— Much confidence is to be placed in the sulph: Zinc: and in fact, all the vitriolic emetics have proved, in some cases, beneficial, although given under the most unfavourable terms, & we should therefore under such circumstances, not neglect them altogether.— They do not produce that languor & prostration of strength, though desirable in the first stage, would prove injurious in the latter, by increasing the debility.— When all the foregoing remedies have been tryed & to no effect, & the difficulty of respiration still exists, the operation of Tracheotomy has been

performed, & by some it is much recommended, while on the other hand, by some it has been greatly depreciated, & among the latter we find Dr Chapman, who in his usual cautious way says it can be performed, but with any advantange he cannot say, at any rate he has never in the course of his practice in City found or heard of it, even being attended with benefit. — We also find in the treatise of Dr Cheyne on this disease, similar remarks, and his practice in this disease appears to have been very extensive. — His own words are to this effect, "That it becomes the Surgeon for the credit of his profession, to decline an operation so improbable & which proceeds from a mechanical & contracted view of the disease". — Such being my opinion as regards the operation, & such my views of the disease in question, I submit it, Gentlemen, for your Consideration & Reflection. ——